

Peterson 18

Serial No. 09/915,963

Claims Listing

1 1. (Canceled)

1 2. (Canceled)

1 3. (Currently Amended) An antenna structure comprising:2 at least one antenna element, the at least one antenna element having at least one
3 taper; and

4 a symmetrical finite ground plane coupled with the at least one antenna element;

5 wherein the at least one antenna element comprises a traveling wave antenna supporting a
6 phase velocity greater than the speed of light and the antenna structure of Claim 1,7 wherein the taper comprises a linear profile, a linear constant profile, a broken-linear
8 profile, an exponential profile, an exponential constant profile, a tangential profile, a step-
9 constant profile, or a parabolic profile.10 4. (Currently Amended) An antenna structure comprising:11 at least one antenna element, the at least one antenna element having at least one
12 taper; and

13 a symmetrical finite ground plane coupled with the at least one antenna element;

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8 | wherein the at least one antenna element comprises a traveling wave antenna supporting a
9 | phase velocity greater than the speed of light and the antenna structure of Claim 1,
10 | wherein the antenna structure supports a cigar-like directional three-dimensional beam
11 | pattern and a butterfly wing-like directional three-dimensional beam pattern.

1 | 5. (Currently Amended) The antenna structure of Claims 3 or 4 (Claim 1),
2 | wherein the at least one antenna element is positioned at an angle from the symmetrical
3 | ground plane.

1 | 6. (Original) The antenna structure of Claim 5, wherein the angle is about 90
2 | degrees with respect to the x-, y- and z- axes.

1 | 7. (Currently Amended) The antenna structure of Claims 3 or 4 (Claim 1),
2 | wherein the at least one antenna element is coupled with the symmetrical ground plane by
3 | means of an unbalanced impedance.

1 | 8. (Original) The antenna structure of Claim 7, wherein the unbalanced
2 | impedance comprises a coaxial cable.

1 | 9. (Original) The antenna structure of Claim 7, wherein a first conductor of
2 | the unbalanced impedance mechanically couples the at least one antenna element with the
3 | symmetrical ground plane.

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1 10. (Currently Amended) The antenna structure of Claims 3 or 4 ~~Claim 4~~,
2 wherein the symmetrical ground plane is disk shaped.

1 11. (Canceled)

1 12. (Canceled)

1 13. (Currently Amended) An antenna structure comprising:
2
3 an array of at least two antenna elements, each antenna element having at least
4 one taper;
5
6 a symmetrical finite ground plane; and
7
8 an unbalanced impedance for coupling the array of at least two antenna elements
9 with the symmetrical ground plane;
10
11 wherein at least one antenna element of the array comprises a traveling wave antenna
12 supporting a phase velocity greater than the speed of light and The antenna structure of
13 Claim 4, wherein the taper of at least one antenna element of the array comprises a
14 linear profile, a linear constant profile, a broken-linear profile, an exponential profile, an
15 exponential constant profile, a tangential profile, a step-constant profile, or a parabolic
16 profile.

1 14. (Currently Amended) An antenna structure comprising:

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3 an array of at least two antenna elements, each antenna element having at least
4 one taper;
5
6 a symmetrical finite ground plane; and
7
8 an unbalanced impedance for coupling the array of at least two antenna elements
9 with the symmetrical ground plane;
10
11 wherein at least one antenna element of the array comprises a traveling wave antenna
12 supporting a phase velocity greater than the speed of light and the antenna structure of
13 Claim 11, wherein each antenna element of the array supports a cigar-like directional
14 three-dimensional beam pattern and a butterfly wing-like directional three-dimensional
15 beam pattern.

1 **15. (Currently Amended) The antenna structure of Claims 13 or 14 or Claim 11,**
2 **wherein each antenna element of the array is positioned at an angle from the symmetrical**
3 **ground plane.**

1 **16. (Original) The antenna structure of Claim 15, wherein the angle for each**
2 **antenna element is about 90 degrees with respect to the x-, y- and z- axes.**

1 **17. (Currently Amended) The antenna structure of Claims 13 or 14 or Claim 11,**
2 **wherein the unbalanced impedance comprises a coaxial cable.**

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1 18. (Original) The antenna structure of Claim 17, wherein a first conductor of
2 the unbalanced impedance mechanically couples each antenna element of the array with
3 the symmetrical ground plane.

1 19. (Currently Amended) The antenna structure of Claims 13 or 14~~Claim 11~~,
2 wherein the symmetrical ground plane is disk shaped.

1 20. (Currently Amended) The antenna structure of Claims 13 or 14~~Claim 11~~,
2 further comprising a slow wave antenna to widen the directivity of the antenna structure.

1 21. (Canceled)

1 22. (Currently Amended) An apparatus comprising:
2
3 a transceiver; and
4
5 an antenna structure for radiating or capturing electromagnetic energy from or to
6 the transceiver comprising:

7
8 at least one antenna element having at least one taper, the taper comprising
9 a linear profile, a linear constant profile, a broken-linear profile, an
10 exponential profile, an exponential constant profile, a tangential profile, a
11 step-constant profile, or a parabolic profile;

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13 a symmetrical disk shaped finite ground plane, the at least one antenna
14 element being positioned at an angle from the symmetrical disk shaped
15 finite ground plane; and
16
17 an unbalanced impedance for coupling the at least one antenna element
18 with the symmetrical disk shaped finite ground plane;
19
20 wherein the at least one antenna element comprises a traveling wave antenna supporting a
21 phase velocity greater than the speed of light and the apparatus of claim 21, wherein the
22 at least one antenna element supports a cigar-like directional three-dimensional beam
23 pattern and a butterfly wing-like directional three-dimensional beam pattern.

1 23. (Currently Amended) The antenna structure of Claim 2122, wherein the
2 angle is about 90 degrees with respect to the x-, y- and z- axes.

1 24. (Currently Amended) The antenna structure of Claim 2422, wherein the
2 unbalanced impedance comprises a coaxial cable.

1 25. (Currently Amended) The antenna structure of Claim 2122, wherein a first
2 conductor of the unbalanced impedance mechanically couples the at least one antenna
3 element with the symmetrical ground plane.